Waiting Times in California's Emergency Departments

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Study objective: Many perceive emergency department crowding as a significant problem that is getting worse. A national survey of ED directors defined crowding, in part, as waiting more than 1 hour to see a physician, a wait considered likely to result in adverse outcomes. Yet few data are available on ED waiting times among a heterogeneous group of hospitals serving a distinct geographic region.

Methods: We observed a random sample of 1,798 patients visiting 30 California EDs between December 15, 2000, and May 15, 2001. We defined waiting time as the interval from ED arrival to first contact with a physician or midlevel provider.

Results: Patients waited an average of 56 minutes (95% confidence interval [CI] 52 to 61 minutes; median 38 minutes); 42% waited longer than 60 minutes. Ordinary least squares regression analysis revealed that waiting times were significantly longer at hospitals in poorer neighborhoods: for every $10,000 decline in per capita income, patients waited 10.1 minutes longer (95% CI 1.8 to 18.4 minutes; P=.02) after adjusting for hospital ownership, teaching status, trauma status, proximity to a recently closed ED, ED volume, patient severity, and age. Lower ratios of physicians and triage nurses to waiting room patient were also associated with longer waits.

Conclusion: Waiting times often exceeded the threshold set by a survey of ED directors. Further study is required to examine factors that lead to longer waiting times at hospitals in low-income areas. Physician and nurse staffing should be investigated as a means of reducing waiting times.

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INTRODUCTION

Emergency department crowding and diminishing capacity are growing concerns among the public,[1-5] health professionals,[6-9] and policy makers.[10-12] Although reports of long waiting times and crowding have permeated the popular press recently,[1-5,13-15] few system-wide data are available to support these claims. Previous peer-reviewed studies of waiting times in US EDs are limited to surveys of health professionals, whose perceptions of crowding reflect those of the general public. For example, surveys of ED directors in California[16] and nationally[6] showed that greater than 90% of respondents believed ED crowding to be a significant problem, and more than 70% defined crowding as a waiting time of more than 60 minutes to see a physician.

Despite these figures, no multicenter, primary data collection has been conducted to measure actual waiting times among a heterogeneous group of hospitals serving a distinct state. Such regionally based studies are significant because states vary in how they regulate EDs and thus in terms of their approach to solving the problem of crowding. In California, for example, hospitals can open and close EDs voluntarily. This policy has raised concerns about decreasing ED capacity and prompted legislative proposals to regulate closures. For instance, in 1999, the California State Assembly considered a bill requiring hospitals to assess the effect of ED closures before discontinuing services.[11]

California, in particular, provides a good setting for a regional study of ED waiting times among a diverse group of hospitals. California is a populous state with rural and agricultural regions, as well as densely populated urban areas. Thus, the results of such a study could be relevant to EDs in a variety of locales. In addition, recent reports of increasing ED closures[1,14,17] and the resulting poor geographic distribution of facilities across the state have spurred attempts to regulate the system to stabilize ED capacity, decrease waiting times, and ensure access to prompt emergency care for all Californians.[10,11] The results of these efforts could inform future endeavors.

As such, we undertook a study to determine ED waiting times among a heterogeneous sample of hospitals within California and to determine those factors that might contribute to longer waits. In particular, we examined the association between waiting times and (1) specific hospital characteristics, the results of which might be relevant at a broader level to policymakers and health care system administrators, and (2) specific ED characteristics, the results of which might pertain more specifically to ED directors and nurse managers.

MATERIALS AND METHODS

We selected a stratified random sample of 35 EDs from a list of all licensed acute care hospitals in California, which we obtained from California's Office of Statewide Health Planning and Development (OSHPD). We included all nonfederal hospitals licensed as general acute care or rural general acute care facilities that reported having an ED with a physician present at all times. According to OSHPD's categorization of EDs on the basis of emergency medical services (EMS) levels, we included basic EDs (ie, those providing 24-hour, in-house physician coverage and comprising 84% of all California EDs) and comprehensive EDs (ie, those delivering more extensive services and comprising 3% of all California EDs) but excluded standby EDs (ie, those having a physician on call who is not required to be physically present at all times and representing 13% of California EDs) because these facilities do not receive ambulances and do not have a physician present at all times. Additionally, we excluded hospitals licensed as acute psychiatric facilities, long-term psychiatric facilities, chemical dependency recovery hospitals, and state correctional facilities.

We stratified the sample according to (1) proximity to a recently closed ED (closed-adjacent versus non-closed-adjacent ED) and (2) trauma designation (trauma versus nontrauma center). Stratification on the basis of these 2 variables provided a more balanced sample to make comparisons with these 2 variables. We obtained information on trauma designation from the California Emergency Medical Services Authority.[18] To determine proximity to a closed ED, we used the *Dartmouth Atlas of Healthcare*'s health service area designations, which

represent local health care markets for community-based inpatient care according to 1993 Medicare provider files.[19] We designated hospitals as closed-adjacent if they were in the same health service area as an ED that had closed between January 1, 1996, and August 31, 2001. In all of our analyses, we also used the most current (ie, 1999) OSHPD data to determine a hospital's ownership and teaching status. We considered state-, county-, and city-owned facilities to be public hospitals and categorized all other hospitals as being privately owned.

Next, we followed a 4-stage sampling algorithm, which took into account (1) a hospital's proximity to a recently closed ED and its trauma status, (2) the total number of annual ED visits at each facility in 1999, (3) days of the week with reported higher patient volumes (eg, Fridays and Saturdays), and (4) hours of the day with reported higher patient volumes (eg, afternoons and evenings). To determine waiting times for the typical California ED patient more precisely, we sampled EDs proportional to their annual ED volume and proportional to the typical ED volume by days of the week and hours of the day, using previously published reports of such information.[20,21] To achieve the power to compare hospitals, we oversampled closed-adjacent and trauma facilities.

Of the 35 hospitals selected for the sample, 4 (a county teaching hospital, a university hospital, and 2 private hospitals) declined to participate in the study. Initially, we also sampled a fifth hospital because we thought it was near a closed ED; however, telephone verification revealed that the neighboring facility had changed both its name and OSHPD identification number but was still in operation. Therefore, we excluded the fifth hospital from the sample because it was not adjacent to a closed facility. Thus, our final sample included 30 facilities.

Two to 6 trained data collectors made between one and six 8-hour visits to each of the 30 EDs in our sample between December 1, 2000, and May 31, 2001, to determine ED patient waiting times. The total number of visits equaled 94. We determined the number of visits per facility on the basis of the annual ED patient volume reported in the 1999 OSHPD database. The number of data collectors dispatched to each facility depended on the ED size, layout, patient volume, and the time of day during which the data were to be collected. We informed the ED director, nurse manager, and the attending physician on duty at least 1 week in advance of the visit and obtained human subjects approval from the institutional review board at our facility, as well as the institutional review board or equivalent body at all of the 30 study sites.

Observers completed 2 sets of tasks. First, they observed patients as they arrived and tracked their progress through the ED. We defined "waiting time" as the time from a patient's arrival at the ED to his or her first contact with a physician, "arrival time" as the time the patient or ambulance gurney transporting the patient first crossed the threshold and entered the ED, "time of initial provider contact" as the time of a physician's first interaction with the patient, "ED patient" as any patient physically present in the ED treatment area, "waiting room patient" as any patient outside the clinical area waiting to be seen by a physician, "ED nurse" as any registered nurse on duty in the ED treatment area, and "triage nurse" as any registered nurse designated to initially screen patients waiting to be seen by a physician. The data collectors observed the entrance to the ED throughout each entire visit to obtain arrival times. Before the observation period, observers were given 24 predetermined random times (3 per hour) and told to track the first patient that arrived after the random time points. They recorded ED patients' arrival times and the times of their initial contact with a provider. In facilities in which midlevel providers functioned as health care providers in the ED, they coded patients' contact with a nurse practitioner or physicians' assistant as "contact with a physician." Data collectors did not interact with patients.

Second, the data collectors assessed ED capacity at 4-hour intervals (ie, the beginning, middle, and end of each observation period), recording point estimates of several indicators of ED capacity: the number of patients in the ED patient care area, the type of service for which the patients were waiting (eg, specialist consultation, diagnostic test, inpatient bed), the total number of ED beds, and the number of staff present to care for these patients.

Only patients with complete data were included in the analysis.

The data collectors tracked 28 patients in teams of 2 to test interobserver reliability. They independently recorded the patients' ED arrival times and physician contact times according to established data collection procedures.

For each of the 30 EDs included in the sample, we used the 1990 US Census to obtain zip code level data on the percentage of urban areas within each hospital zip code, the percentage of residents older than 65 years within each hospital zip code, and the per capita income of residents within each hospital zip code.

As mentioned previously, we obtained the EMS level, ownership, and teaching status of each ED in California from OSHPD. All California hospitals are required by law to report basic use data annually to California's OSHPD. More than 500 variables are required in the OSHPD report. It is up to individual institutions to determine their teaching status. Hospitals do not report whether they have an emergency medicine residency.

We also used the data to determine the total number of annual ED visits, the average annual patient severity level, and the operational status (open versus closed ED) of each hospital. When 1999 data were missing (3.6% of the time), we used the most recent year for which such data were available.

We conducted a telephone survey between August 15 and August 20, 2000, to confirm the operational status of each of the 320 facilities reporting basic or comprehensive emergency services to OSHPD on December 31, 1998. ED personnel who answered the telephone (typically an ED nurse or unit secretary) were asked whether their hospital had a functioning ED, a dedicated emergency physician on the premises at all times, and whether they received acutely ill patients by means of ambulance. If they responded "yes" to all of these questions, they were classified as basic or comprehensive EDs.

To verify reported ED closures and downgrades, we also surveyed the 24 facilities in which EMS level had changed from basic or comprehensive to standby or no EMS between January 1, 1996, and December 31, 1998, using the aforementioned methodology. When we were unable to contact hospital personnel (eg, when a hospital was no longer in operation), we contacted nearby hospitals and community organizations (eg, the local chamber of commerce) to verify the status of the closed ED. When inconsistencies were present between the 1999 OSHPD data and the telephone survey data, we used the more up-to-date telephone survey results.

We first computed univariate statistics for all ED measures, including waiting times and the number of patients, beds, and staff at each ED. Using bivariate analysis, we then examined waiting times with regard to both hospital characteristics and ED characteristics. Hospital characteristics included ownership, proximity to a closed ED, teaching status, trauma designation, number of annual ED visits, annual percentage of critical and nonurgent ED patients at each facility (patient severity level), proportion of urban areas within the hospital zip code, per capita income of residents within the hospital zip code, and percentage of residents older than 65 years of age within the hospital zip code. ED characteristics included the ratios of emergency physicians to patients, emergency nurses to ED patients, triage nurses to waiting room patients, ED beds to ED patients, patients waiting for on-call physicians to ED patients, and patients waiting for inpatient beds (floor, telemetry, and ICU) to ED patients. The ratios were relative to the number of ED patients in the ED at the time of the observation. For dichotomous measures (eg, hospital ownership, teaching status, proximity to a closed ED), we used a 2-group *t* test to make comparisons. For continuous measures (eg, staffing, bed capacity, per capita income of residents within the hospital zip code), we used the Pearson correlation coefficient and marginal regression to examine the association between waiting times and a particular measure.

Next, we created multivariate models by using ordinary least squares regression to test the relationship between waiting times and hospital characteristics, ED characteristics, and a combination of hospital and ED characteristics. We included variables in the multivariate models on the basis of clinical judgment.

All analyses were performed with Stata (version 6, Stata Corporation, College Station, TX) or SAS (version 6, SAS Institute, Inc., Cary, NC) software.

In the "Results" section, we present data from all patients with complete data. However, a subset of patients remained in the ED after observers departed, resulting in data censoring. To investigate the effect of data censoring, we computed waiting times for a subset of patients who arrived within the first hour of each 8-hour observation period, thus ensuring that the data collectors observed these patients for at least 7 hours. We then conducted bivariate analysis on these data to determine how data censoring might have influenced our results.

Once the data were collected, we constructed and applied analytic weights to obtain parameter estimates that represented the typical California ED patient. In creating the weights, we took into account the design of the 4-stage sampling algorithm. For each of the 94 eight-hour observation sessions, we assigned weights that were proportional to (1) the total number of annual ED visits at each hospital as reported to OSHPD and (2) the relative number of patients hospitals typically treat during each day of the week and each 8-hour segment of the day (thus reflecting how busy the hospitals typically were at different times of day and days of the week) on the basis of data from previously published reports.[20,21] Each component of the weights thus reflected the relative importance of these factors. The analytic weights then were calculated as the product of these component proportions. Finally, we rescaled the weights so that the summation of the analytic weights was equal to the total number of ED visits in California during 1999. In the model-fitting process, we took into account all the design effects, including patient clustering within hospitals, sampling stratification, and analytic weights.

RESULTS

We observed a total of 1,798 patients in 30 California EDs. Of these, 1,208 patients completed their ED visit before the end of the observation period, and this is the group comprising our analytic sample. Forty-one of the 1,208 patients did not have adequate data to obtain analytic weights and thus were excluded from the linear regression models. Table 1 compares our sample of ED visits with all statewide ED visits in California during 1999. Our sample visits are similar to all California ED visits, with the exception of trauma center visits and visits to closed adjacent facilities, which we oversampled to make comparisons on the basis of these variables.

For the typical California ED patient, the mean waiting time was 56 minutes (95% confidence interval [CI] 52 to 61 minutes; median 38 minutes). Forty-two percent of patients (3.9 million persons in 1999) waited more than 1 hour to see a physician. Our bivariate analysis of hospital characteristics revealed that waiting times were 26.5 minutes longer at public hospitals (95% CI 18.3 to 34.7 minutes longer), 20.1 minutes longer at teaching hospitals (95% CI 13.3 to 26.8 minutes longer), 24.1 minutes longer at closed-adjacent facilities (95% CI 17.1 to 31.0 minutes longer), and 26.2 minutes longer at trauma centers (95% CI 19.6 to 32.8 minutes longer; $P<.001$ for all). These results are

Table 1.
ED visits made by study patients versus those made by all California patients in 1999.

Hospital Characteristic	ED Visits Made by Study Patients* (N=1,208), No. (%)	ED Visits Made by All California Patients (in Millions; N=8.4), No. (%)
Trauma center†		
Yes	673 (56)	1.9 (22)
No	535 (44)	6.6 (78)
Ownership‡		
Private	971 (80)	6.7 (80)
Public	237 (20)	1.7 (20)
Proximity to closed facility§		
Adjacent	346 (29)	1.4 (16)
Not adjacent	862 (71)	7.1 (84)
Teaching status‡		
Yes	451 (37)	2.1 (25)
No	757 (63)	6.4 (75)

*We include only those visits made by study patients for whom complete data were available. In our analysis, we weighted these visits to be representative of all California ED visits.
†We obtained the trauma center designation from California's Emergency Medical Services Authority.[18] Trauma centers were oversampled to achieve the power to make comparisons.
‡We obtained ownership and teaching status from California's OSHPD 1999 database.
§We defined a closed-adjacent ED as an ED located in the same service area as an ED that closed after 1995.[19] Closed-adjacent EDs were oversampled to achieve the power to make comparisons.

displayed in the Figure. Our analysis revealed only weak correlation between longer waits and the following factors: annual ED volume, percentage of urban areas within the hospital zip code, per capita income of residents within the hospital zip code, percentage of residents older than 65 years within the hospital zip code, and annual percentage of critical and nonurgent ED patients at each facility ($R \leq 0.2$; $P < .05$ for all).

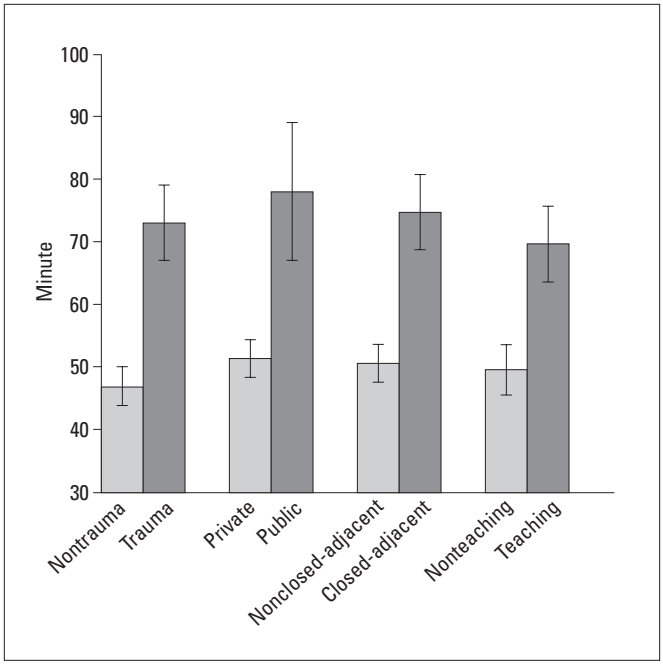
Table 2 shows the results of our linear regression analyses of hospital characteristics and ED characteristics. For hospital characteristics, we found that for each $10,000 decrease in the per capita income of residents within the hospital zip code, patients waited an average of 10.1 minutes longer (95% CI 1.8 to 18.4 minutes longer; $P = .02$). We adjusted the model for ownership, trauma status, proximity to a closed ED, number of annual ED visits, percentage of urban areas within the hospital zip code, percentage of residents older than 65 years within the hospital zip code, and percentage of critical and nonurgent patients seen annually at each facility. The R^2 value for this model is 0.096. For ED characteristics, our multivariate analysis revealed no independent predictors of ED waiting times.

The results of the combined multivariate model (hospital characteristics and ED characteristics) are presented in Table 2. In the combined model, the average waiting time was less at sites with a larger proportion of nonurgent patients, as well as those with a higher ratio of triage nurses to waiting room patients, physicians to ED patients, and patients waiting for inpatient beds to ED patients. For each 10% increase in nonurgent patients seen annually, the average waiting time was 4.8 minutes less (95% CI 1.9 to 7.7 minutes less; $P = .002$); for each additional triage nurse per ED patient, waiting times for all other patients were reduced by an average of 28.8 minutes (95% CI 0.42 to 53.4 minutes less; $P = .02$); for each additional physician per ED patient waiting, waiting times were reduced by 82 minutes (95% CI 0.8 to 163.2 minutes less; $P = .04$); and for each additional patient waiting for an inpatient bed per ED patient, waiting times were 64.1 minutes less (95% CI 8.7 to 119.5 minutes less; $P = .02$). The R^2 value for the combined model was 0.17.

Interobserver reliability testing revealed that the mean difference between the data collectors' recorded arrival times was 0.14 minutes (8.4 seconds), and the mean difference between their recorded provider times was 0.33 minutes (19.8 seconds). These differences were not significantly different from zero ($P = .3$ and .5, respectively).

Five hundred ninety-three (33%) of 1,798 study participants' visits continued for longer than the observation period and thus were censored. To test the effect of data censoring on our estimates of mean waiting time, we analyzed the subset of patients who arrived during the first hour of data collection (who had less missing data) and compared these results with those of patients arriving over the course of the 8-hour observation period. Of this subset of patients arriving in the first hour, 15% had visits that lasted longer than the observation period

Figure.
Unadjusted mean waiting time by hospital characteristics (n=1,208). "Waiting time" is defined as the interval from ED arrival to first contact with a physician. We include only those visits made by study patients for whom complete data were available. Error bars represent 95% CIs (P<.*0001 for all comparisons).*



and thus had incomplete data. The mean waiting time for the first-hour arrivals with complete data was 58 minutes (95% CI 48 to 67 minutes). This is not significantly different from the average of 56 minutes for the entire sample (P=.8). However, we observed a difference with regard to hospital ownership for this subset of patients. The mean waiting time for patients arriving in the first hour of observation to private facilities was 53 minutes, which is identical to the mean for patients who arrived at private hospitals at any hour; however, the mean waiting time for patients arriving in the first hour of observation at public hospitals was 98 minutes, which is 15% longer than the mean waiting time of 83 minutes for the entire sample (P=.005).

DISCUSSION

In our representative sample of California ED patients, we found that more than 40% waited more than 1 hour to see a physician. We used 3 regression models to examine the effects of (1) hospital characteristics, (2) ED characteristics, and (3) a combination of hospital and ED characteristics on patient waiting times. The first model might prove useful to policy makers in evaluating how to direct policies toward hospitals with longer waiting times, and the second and third models should prove useful to emergency physicians and ED administrators attempting to reduce waiting times. Our analysis of waiting times revealed that patients waited longer at hospitals located in zip codes in which residents had lower per capita incomes and at those with a lower proportion of nonurgent patients. In our combined model, the average wait was less at facilities with a higher proportion of nonurgent patients, those with higher ratios of triage nurses and physicians to patients, and those with a higher ratio of patients waiting for inpatient floor beds to ED patients.

There are several possible reasons for our finding that waiting times are longer at hospitals in lower income areas. First, these facilities care for a disproportionate number of uninsured patients who might have more complex medical problems and require additional financial, administrative, and social support.[22-24] This situation affects both public and private hospitals be-

Table 2.
Independent predictors for hospital characteristics of mean waiting times[*] in minutes.[†]

	Model Adjusting for Hospital Characteristics Only (N=1,167)[‡]		Model Adjusting for ED Characteristics Only (N=1,167)[‡]		Model Adjusting for Both Hospital and ED Characteristics (N=1,167)	
Predictors	**Coefficient[§]**	***P* Value**	**Coefficient**	***P* Value**	**Coefficient**	***P* Value**
Hospital characteristics						
Per capita income (in $10,000) in hospital zip code[§]	–10.1	.02	—	—	—	NS[‖]
Percentage of total 1999 visits that were nonurgent[§]	—	NS[‖]	—	—	–0.5	.002
ED characteristics						
Ratio of triage nurses to ED patients[§]	—	—	—	NS[‖]	–28.8	.02
Ratio of emergency physicians to ED patients[§]	—	—	—	NS[‖]	–82.0	.04
Ratio of ED patients waiting for inpatient beds to ED patients[§]	—	—	—	NS[‖]	–64.1	.03

[*]Waiting time is defined as the interval from ED arrival to first contact with an emergency physician.
[†]Each model was adjusted for hospital characteristics (ownership, proximity to closed ED, teaching status, trauma designation, per capita income of residents within the hospital zip code, percentage of residents >65 years within the hospital zip code, percentage of urban areas within the hospital zip code, annual ED visits, and average annual patient severity level), ED characteristics (ratios of emergency physicians to patients, emergency nurses to patients, ED beds to patients, triage nurses to ED patients, patients waiting for on-call physicians to all ED patients, and patients waiting for inpatient beds to all ED patients), or both.
[‡]We include only those visits made by study patients for whom complete data were available.
[§]Values are expressed as regression coefficients. Coefficients represent the mean number of additional minutes patients waited beyond the average for all EDs (56.6 minutes). For example, for each $10,000 decrement in per capita income in that zip code, waiting times were 10.1 minutes longer.
[‖]NS indicates $P \geq .05$. Only comparisons with $P < .05$ are presented.

cause, under the Emergency Medical Treatment and Active Labor Act of 1986,[25] all EDs must provide medical screening examinations and treatment to ensure that all ED patients are stable, regardless of their ability to pay. In addition, the larger numbers of non–English-speaking persons who typically live in areas with lower per capita income[26] might lead to longer waiting times for translators and more diagnostic tests.[27] Another explanation is that these individuals lack access to medical care and were presenting for follow-up and primary care. More study is needed to define the factors that contribute to longer waiting times and their consequences for patients not only in low-income communities but in all facilities. However, our findings suggest that resources might be directed at hospitals in low-income areas, regardless of other facility characteristics, such as teaching status and ownership type.

As we mentioned in the introduction, California lawmakers have been concerned that EDs can close voluntarily without assessing the ramifications of doing so on local ED capacity. However, our findings do not support these concerns. Although we found that waiting times were significantly longer at closed-adjacent hospitals in the unadjusted analysis, this difference was not significant when we adjusted for other facility characteristics, suggesting that proximity to a closed ED alone does not account for the longer waiting times at such facilities.

Within the ED, when we adjust for facility characteristics, the physician and triage nurse staffing ratios were strongly associated with waiting times. It seems logical that facilities with more physicians per patient had shorter waiting times. The presence of more triage nurses per waiting room patient was also associated with shorter waits, perhaps because patients are triaged faster, reducing overall waits, or because EDs with a well-staffed triage are more efficient in other ways. These factors need to be examined further and possibly changed to reduce ED waiting times.

In addition, the number of patients waiting for inpatient floor beds was associated with shorter waiting times. This might be because when more admitted patients are waiting for an inpatient bed, overall patient severity might be higher, resulting in a reduction in the average time to first contact with a physician. Alternatively, EDs with more patients waiting for inpatient floor beds might be better managed and more efficient than others. Perhaps patients are more likely to be seen in hallways or have ancillary services available.

There are several limitations to our analysis. The first is the problem of data censoring. Five hundred ninety-three (33%) of 1,798 of our sample visits continued beyond the 8-hour observation period. Sensitivity analyses examining patients who arrived within the first hour of data collection indicate no underestimate of waiting times for private hospital patients but suggest that we might have underestimated public hospital waiting times by 15%. Consequently, the problem of long waiting times in public EDs might be even more serious than our data suggest.

An additional limitation is the effect of the data collectors on ED personnel during our observation visits. Although the observers were trained to interact minimally with ED personnel, it is possible that their presence motivated staff to work quickly, resulting in shorter waiting times during the data collection periods. Alternatively, the observers could have inhibited ED flow, resulting in a bias toward longer waiting times. Because the data collection procedures were identical at all facilities, it seems unlikely that they could have systematically biased particular hospitals in different ways (eg, longer waiting times at public hospitals but not private hospitals).

In addition, to preserve patient anonymity, we did not examine medical records and thus could not stratify individual waiting times on the basis of patient severity. However, we were able to compare waiting times at different types of facilities and stratify them on the basis of average annual patient severity levels. As expected, this was an important covariate of staffing and bed capacity in predicting ED waiting times. Models omitting facility-level characteristics showed similar directional effects of staffing and beds but poorer precision as a consequence. Finally, our winter and spring data collection period might have biased the estimates of waiting times upward relative to the rest of the year, although the influenza season in 2000 to 2001 was less severe than had been predicted.[28]

A national sample of ED directors defined crowding based, in part, on waiting times, and the majority believed crowding increases the risk of poor outcomes.[6] Additionally, patient satisfaction has been shown to be correlated with the time it takes to see a physician.[29] Although individual hospitals will want to identify their own threshold for what constitutes dangerously excessively waiting times, it is worthwhile to consider the monitoring and reduction of ED waiting times for all hospitals. We have identified several structural factors, such as physician and triage nurse staffing, that are associated with longer waiting times in California EDs. These represent some initial findings that might be used to reduce waiting times and move toward ensuring timely access to emergency care for all. Particularly at this time, when the balance between supply of and demand for care in the nation's EDs is vulnerable to threats ranging from bioterrorism to the current economic downturn, identifying those factors responsible for prolonged waiting times is all the more crucial.

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